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EFFECT OF INBREEDING ON AGE AT FIRST CALVING OF BROWN SWIS RAISED AT REGIONAL AGRICULTURAL SCHOOL IN VAN

(Van Tarım Meslek Lisesi İşletmesinde Yetiştirilen İsviçre Esmeri Sığırlarda İlkine Buzağılama Yaşı Üzerine Akrabalı Yetişme Katsayısının Etkisi)

Ali KAYGISIZ * **Yusuf VANLI ***

SUMMARY

The aim of this study was to determine the whether the Brown Swiss cattle raised at Regional Agricultural School in Van were inbred and to calculate the effect of inbreeding on age first calving.

Mean coefficients of inbreeding were found to be 6.88 ± 0.96 %, ranging between 0 % and 34.38 %.

The regression estimate for age at first calving was 1.72 ± 1.61 days, which indicated that the age at first calving increascd by 1.72 days for each one percent increase in inbreeding. The regression analysis showed a non-significant (P>0.05) effect of inbreeding on age at first calving.

KeyWords: Inbreeding, Age at First Calving, Brown Swiss Cattle

ÖZET

Bu çalışmada Van Tarım Meslek Lisesi İşletmesinde Yetiştirilen İsviçre Esmeri Sığırlarda ilkine buzağılama yaşına akrabalı yetişme katsayısının etkileri incelenmiştir.

Sürüde ortalama akrabalı yetişme katsayısı % 0 ile % 34.38 arasında değişmiş ve ortalama % 6.88 ± 0.96 olarak bulunmuştur.

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* : Department of Animal Breeding and Genetics, Faculty of Agriculture, University of Kahramanmaraş Sütçü imam. KAHRAMANMARAŞ -TÜRKİYE.

İlkine buzağılama yaşına akrabalı yetişme katsayısının regresyonu 1.72 ± 1.61 gün olarak bulunmuştur. İIkine buzağılama yaşına akrabalı yetişme katsayısının etkisi önemsiz (P>0.05) bulunmuştur.

Anahtar Kelimeler: Akrabalı yetişme, ilkine buzağgılama yaşı, İsviçre Esmeri Sığır.

INTRODUCTION

Age at first calving in an economic traits in dairy cattle production since the earlier the age at first calving, the Ionger the productive life and hence total life production of the animal. Consequently, first calving in early ages is very desirable in dairy cattle and it would be important to note as the factors that affect it.

Although inbreeding may be one of the most useful system of mating, it has deleterious influences on reproductive traits of dairy animals (1, 4, 6, 10, 11, 12, 14, 16). The age at first calving increased with inbreeding level in cows (1, 6, 14). On the other hand, some investigators ruled out any such damage (2, 8, 13).

Present study was thus planned to estimate the magnitude of inbreeding effects on age at first calving in a herd of Brown Swiss Cattle.

MATERIALS and METHODS

Kaygısız (9) described the history of the studied herd. Pedigree and performance records of III Brown Swiss cattle raised at the Regional Agricultural School of Van from 1967 to 1992 were used in the present study.

Inbreeding coefficients of Brown Swiss cattle in the herd were calculated out by the Wright's (18) method of path coefficient, were ranged from 0 to 34.38 %, with a mean of 6.88 ± 0.96.

The effect of inbreeding on age at first calving were determined by the regression analysis. Thus, to examine the inbreeding effect the data were classified according to the year of birth and analysed by least squares technique (7).

The mathamatical model;

$Y_{ij} = \mu + a_i + b_ı (X_{ij}-X)+e_{ij}$

where, μ is population mean, a_i is effect of ith year, $b_ı$ is regression on inbreeding coefficient on age at first calving, X_{jj} = i th year J th cow inbreeding coefficient, X is mean inbreeding coefficient, e_{jj} is residual random error assumed normally and independently distributed with zero mean and variance σ^2 (NID) (0, σ^2).

RESULTS and DISCUSSION

The analysis of the pedigree data revealed that out of III cattle raised at the farm during the period under study 43 (39 %) were inbred in varying levels. Inbreeding coefficients ranged from 0 to 34.38 percent with means 6.88 ± 0.96 %. Average age at first calving 1084.58 ± 36.17 days (Table 1).

The regression estimate for age at first calving due to inbreeding was 1.71 ± 1.61 days, which indicated that the age at first calving increased by 1.72 days for each one percent increase in inbreeding (Table 2). The regression anlysis showed a non-significant (P>0.05) effect of inbreeding on age at first calving (Table 3).

Table 1. Means for inbreeding coefficient and age at first calving in cattle.

Traits	Means	Range
İnbreeding	6.88 ± 0.96	0.00 - 34.38
Age at first calving	1084.58 ± 36.16	908.00 - 1394.00

Table 2. Effect of inbreeding on age at first calving by regression analysis.

Trait	No of observations	Average inbreeding	Regression coefficient
A.F.C	111	6.88 ± 0.96	1.72 ± 1.61

Table 3. Analysis of variance for regression of age at first calving due to inbreeding.

Trait	Source of variation	Degree of freedom	Mean squares	F. Ratio
A.F.C	Regression	1	18932.28	1.146^{NS*}
	Residual	86	16521.40	

*NS : Non -Significant

This result agreement with those reported by Belic and Vukovic (2) that a moderate degree of inbreeding has no effect on age at first calving. On the other hand, this result disagreed with those reported by Fuentis et al (5) and Galal et al (6). The small number of animals involved in the present study which resulted in high standard errors in our estimates could be responsible for the differences between the present result and those of Fuentis et al (5) and Galal et al. (6). In addition, Robertson (15) and Rognoni and Rizzi (16) concluded from their studies on Frisian herd that inbreeding has no effect on age at first calving while, Beller and Plasnik (3) observed significant difference between inbred and outbred Slovakian cattle, inbreeds registering coefficient of inbreeds being 12.5 % in their investigators.

CONCLUSION

Results of this study are in general agreement with results of some studies and suggest that inbreeding is detrimental reproductive performance in Dairy cattle. Results also suggest that inbreeding has similar effects on reproduction in other dairy cattle breeds.

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